CLAIMS

What is claimed is:

1. A detector arrangement that is adapted for measuring radiation from selected detection areas in a microfluidic device comprising: a disc with an axis of symmetry, and at least one detection area which is associated with a detection microcavity containing a substance causing radiation to be measured, wherein said arrangement comprises:

(a) a detector head with a focal area,

(b) a disc holder comprising a means I that enables the focal area to transverse the surface of the disc in an essentially circular manner or a means II that enables the focal area to transverse the surface of the disc in an essentially radial direction,

(c) an angular aligning system for recognizing the angular position of a part area which at a particular time is covered by the focal area, and

(d) a radial aligning system for recognizing the radial position of a part area which at a particular time is covered by the focal area, and

(e) a controller that controls means I and means II causing the focal area to transverse the detection areas in an annular zone of the disc, and the detector head collects radiation in a preselected manner from individual subareas within at least one of the detection areas in said annular zone.

2. The arrangement of claim 1, wherein said disc holder comprises means I and means II.

3. The arrangement of claim 1, wherein said detector head is used for laser induced fluorescence.

4. The arrangement of claim 3, wherein said laser induced fluorescence is combined with a confocal technique.

5. The arrangement of claim 1, wherein the focal area has dimensions such that it covers at least one selected detection area which is at the same angular position.

6. The arrangement of claim 1, wherein the focal area has dimensions such that it covers only a part of the detection area.

7. The arrangement of claim 1, wherein said disc comprises a home position mark.

8. The arrangement of claim 7, wherein said means I comprises a spinner.

9. The arrangement of claim 8, wherein said angular aligning system comprises an encoder in which the grades of the encoder are linked to angular positions on the disc relative to the home position mark.

10. The arrangement of claim 9, wherein said means II comprises a translation responder for moving the detector head in a radial direction.

11. The arrangement of claim 1, wherein said disc is made of plastic material.

12. The arrangement of claim 11, wherein said plastic material is black.

13. The arrangement of claim 1, wherein said substance is immobilized in the detection microcavity during flow conditions.

14. An arrangement comprising a microfluidic device and a detector head, wherein said microfluidic device is fabricated in plastic material and comprises at least one detection microcavity which is associated with a detection area on the surface of said device, and wherein said detector head utilizes confocal technique and comprises an objective for collecting radiation associated with a substance which is in said detection microcavity.

15. The arrangement of claim 13, wherein the radiation is fluorescence or luminescence.

16. The arrangement of claim 13, wherein the radiation is laser induced fluorescence.

17. The arrangement of claim 13, wherein said device is a circular disc which is spinnable so that the objective is capable of transversing the surface of the disc in a circular motion.

18. The arrangement of claim 16, wherein the detector head is radially movable so that the objective is capable of transversing the disc in a radial manner.

19. A method for determining the amount of at least one substance comprising the steps of:

(a) providing a microfluidic device and a detector arrangement, wherein said microfluidic device comprises a plurality of microchannel structures, each of which has an inlet port and a detection microcavity, and a plurality of detection areas, each of which is associated with one of said detection microcavities; and wherein said detector arrangement is capable of collecting radiation from individual subareas of each of said detection areas;

(b) processing one or more liquid aliquots in at least one of said plurality of microchannel structures so that said substance is retained in the detection microcavity of each of said at least one of said plurality of microchannel structures;

(c) scanning the detection areas associated with the detection microcavities that are part of microchannel structures in which step (b) has been carried out to obtain radiation from individual subareas (pixels) of each scanned detection area, said scanning being performed by the use of said detector arrangement;

(d) integrating radiation as a function of subarea for each scanned detection area to obtain the amount of radiation from each detection area; and

(e) characterizing for each of the amounts obtained in step (d) a reaction variable that has been included in the process protocol used for each microchannel structure.

20. The method of claim 18, wherein the influence of peak noise pixels on the result of the integrating is removed in step (d).